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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,996	02/07/2001	Konstantinos I. Papathomas	END920000065US1	8725

7590

07/05/2002

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EXAMINER

KEEHAN, CHRISTOPHER M

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 07/05/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

MF-3

**Office Action Summary**

Applicati n N .

09/778,996

Applicant(s)

PAPATHOMAS, KONSTANTINOS  
I.

Examiner

Christopher M. Keehan

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- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2001.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)              | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other:  |

### **DETAILED ACTION**

Note: on page 3, lines 22-25 of the Specification, Applicant appears to be referring to the wrong patent.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10, 12, and 15-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Christie et al. (5,668,059). Regarding Claims 1-7, Christie et al. disclose an encapsulant composition comprising a resin material selected from the group consisting of epoxy and cyanate ester resins, wherein the resin material is a cycloaliphatic epoxide, derived from unsaturated aromatic hydrocarbon compounds, comprising glycidyl ethers, wherein the resin material is at least a dicyanate ester, and wherein the resin material comprises about 20 percent to about 55 percent by weight of the composition (col.3, line 20-col.9, line 46), a flexibilizing agent (col.11, lines 14-33), and a filler material (col.9, line 46-col.10, line 10).

Regarding Claims 8 and 9, Christie et al. disclose a flexibilizing agent selected from the group as instantly claimed, in the instantly claimed range (col.11, lines 14-33).

Regarding Claims 10 and 12, Christie et al. disclose a filler selected from the group as instantly claimed, in an amount included in the range as instantly claimed (col.9, line 46-col.10, line 28).

Regarding Claims 15 and 16, Christie et al. disclose a catalyst selected from the group as instantly claimed (col.10, lines 41-59).

Regarding Claim 17, Christie et al. disclose a viscosity of the composition of about 3000 to about 17000 centipoise at 25°C (col.11, lines 41-45), which is included in the instantly claimed range.

Regarding Claim 18, the same reasoning as set forth above for Claim 1 also applies to Claim 18, as the claimed subject matter is essentially the same. Christie et al. disclose an electronic package as instantly claimed (Figure).

Regarding Claims 19-24, Christie et al. disclose the substrate as instantly claimed (col.12, line 12-col.14, line 45).

Regarding Claims 25-33, the same reasoning as set forth above for Claims 2-10, respectively, also applies to Claims 25-33, as the claimed subject matter is essentially the same.

Regarding Claims 35-40, the same reasoning as set forth above for Claims 12-17, respectively, also applies to Claims 35-40, as the claimed subject matter is essentially the same.

Regarding Claims 41-43, Christie et al. disclose rapidly mixing the components together, reacting the components together at about 100°C, and performing the mixing under vacuum (col.11, lines 57-67).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 8, 10-15, 17-24, 31, 33-38, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Dershem et al. (6,121,358). Regarding Claim 1, Dershem et al. disclose an encapsulant composition (col.3, lines 25-37) comprising a resin material, a flexibilizing agent, and a filler material, wherein the resin material comprises about 20 percent to about 55 percent by weight of the composition (col.15, line 55-col.16, line 15).

Regarding Claim 8, Dershem et al. disclose a flexibilizer of polybutadienes (col.14, lines 14-20).

Regarding Claims 10-12, Dershem et al. disclose a filler material selected from the group as instantly claimed, more specifically zirconium tungstate (col.16, lines 15-65), which appears to have a negative expansion property, and the filler comprising an amount in the range of about 50 to about 90 weight percent (col.15, lines 60-63).

Regarding Claims 13 and 14, Dershem et al. disclose a substantially spherical filler material of less than about 41 microns treated with coupling agent (col.16, lines 27-65).

Regarding Claim 15, Dershem et al. disclose a catalyst material (col.12, lines 43-56).

Regarding Claim 17, Dershem et al. disclose a viscosity included in the instantly claimed range (col.17, line 64-col.18, line 2).

Regarding Claim 18, the same reasoning as set forth above for Claim 1 (Dershem et al.) also applies to Claim 18, as the claimed subject matter is essentially the same. Dershem et al. disclose an electronic package as instantly claimed (col.19, lines 42-53).

Regarding Claims 19-24, Dershem et al. disclose the substrate as instantly claimed (col.19, line 54-col.21, line 32).

Regarding Claims 31, 33-38, and 40, the same reasoning as set forth above for Claims 8, 10-15, and 17 (Dershem et al.) also applies to Claims 31, 33-38, and 40, as the claimed subject matter is essentially the same.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al. (5,668,059). Christie et al., as applied above, are as set forth and incorporated herein. Christie et al. do not appear to specifically disclose wherein the filler comprises substantially spherical or spheroidal particles. Christie et al. do disclose particles having a particle diameter of less than about 41 microns so that the composition will flow readily into the gap, and a coupling agent positioned thereon (col.9, lines 47-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used particles that are substantially spherical or spheroidal in the composition of Christie et al. because Christie et al. teach that the particles need to have a dimension that would have facilitated the flowing of the composition into the gap between the chip and the substrate.

Claims 11 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al. (5,668,059) in view of Dershem et al. (6,121,358). Christie et al., as applied above, are as set forth and incorporated herein. Christie et al. do not specifically disclose zirconium tungstate as a filler. Dershem et al. disclose an encapsulating composition comprising a resin, flexibilizer, and a filler of zirconium tungstate (as set forth above). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the zirconium tungstate of Dershem et al. in the composition of Christie et al. because Dershem et al. teach that adding a filler which is substantially free of alpha particle emission, such as zirconium

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tungstate, produces reduces the presence of electron/hole pairs, resulting in a higher quality device.

Claims 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dershem et al. (6,121,358). Dershem et al., as applied above, are as set forth and incorporated herein. Regarding Claims 41 and 42, Dershem et al. disclose dispensing the components together, and reacting the components together at above 100°C (col.21, lines 33-67). Although Dershem et al. do not specifically disclose mixing the materials as instantly claimed, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed the materials together in order to dispense the composition.

Regarding Claim 43, Dershem et al. do not specifically disclose performing the mixing under vacuum. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed the materials under vacuum to facilitate evaporation.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bowles et al. (5,982,631) disclose an encapsulation material comprising epoxy resin and a filler comprising zirconium and tungsten, as well as compounds thereof. Zhou et al. (6,057,402) disclose an encapsulation material



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comprising epoxy and cyanate, flexibilizer, and filler, and also discloses a zirconate mixture (col.11, lines 40-45) that does not appear to be used as a filler.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Keehan whose telephone number is (703) 305-2778. The examiner can normally be reached on Monday-Friday, from 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert A. Dawson can be reached on 308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Christopher Keehan *CMK*

*Robert A. Dawson*  
Robert Dawson  
Supervisory Patent Examiner  
Technology Center 1700

June 19, 2002